

1. (Currently amended) An apparatus for treating a liquid with a first and a second chemical, comprising:

a conduit for introducing the liquid from a liquid source into a first inlet port of an intake manifold;

a second inlet port of said intake manifold introducing a first chemical into the liquid;

a first static mixing device having an inlet port connected in fluid communication with an outlet port of said intake manifold for mixing the first chemical with the liquid;

said first static mixing device comprising a first tube having a generally square cross section ~~defining four generally acute corners;~~

said first tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a first plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said first static mixing device for mixing the first chemical with the liquid causing the first chemical flowing through said first tube to rotate and to mix with the liquid;

said outlet port of said first static mixing device being connected to a first inlet port of an interconnecting manifold;

a second inlet port of said interconnecting manifold introducing a second chemical into the liquid;

a second static mixing device having an inlet ~~port connected~~ in fluid communication with an outlet port of said interconnecting manifold for mixing the second chemical with the liquid and for eluting the treated liquid from an outlet port of said second static mixing device;

said second static mixing device comprising a second tube having a generally square cross

~~section defining four generally acute corners; and~~

said second tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a second plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said second static mixing device ~~for mixing the second chemical with the liquid causing the second chemical flowing through said second tube to rotate and to mix with the liquid;~~

2. (Canceled)

3. (Canceled)

4. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 1, wherein said second static mixing device has a cross-section greater than said first static mixing device for providing a high shear first static mixing device and to provide a low shear second static mixing device.

5. (Canceled)

6. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 1, wherein said one of said first and second static mixing device comprises a first and a second spirally twisted tube section;

said first tube section being spirally twisted in a first direction for causing the liquid flowing through said first tube section to flow in a first helical direction; and

said second tube section being spirally twisted in a second direction for causing the

liquid flowing through said second tube section to flow in a second helical direction.

7. (Currently amended) An apparatus for treating a liquid with a first and a second chemical, comprising:

a liquid pump for pumping the liquid from a liquid source into a first inlet port of an intake manifold;

a first chemical pump for pumping a first chemical into a second inlet port of said intake manifold;

a first and a second static mixing device extending between an inlet port and an outlet port; said first static mixing device comprising a first tube having a generally square cross section ~~defining four generally acute corners;~~

said first tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a first plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said first static mixing device for mixing the first chemical with the liquid causing the first chemical flowing through said first tube to rotate and to mix with the liquid;

said second static mixing device comprising a second tube having a generally square cross section ~~defining four generally acute corners;~~

said second tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a second plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said second static mixing device for mixing the second chemical with the liquid causing the second chemical flowing through said second tube to rotate and to mix with the liquid;

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said inlet port of said first static mixing device being connected in fluid communication with an outlet port of said intake manifold for mixing the first chemical with the liquid upon flowing along said plurality of helixes;

said outlet port of said first static mixing device being connected to a first inlet port of an interconnecting manifold;

a second chemical pump for pumping a second chemical into a second inlet port of said interconnecting manifold; and

said second static mixing device having an inlet port connected in fluid communication with an outlet port of said interconnecting manifold for mixing the second chemical with the liquid and for eluting the treated liquid from an outlet port of said second static mixing device.

8. (Canceled)

9. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 7, wherein said second static mixing device has a cross-section greater than said first static mixing device for providing a high shear first static mixing device and to provide a low shear second static mixing device.

10. (Canceled)

11. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 7, wherein said one of said first and second static mixing device comprises a first and a second spirally twisted tube section;

said first tube section being spirally twisted in a first direction for causing the liquid flowing through said first tube section to flow in a first helical direction; and

said second tube section being spirally twisted in a second direction for causing the liquid flowing through said second tube section to flow in a second helical direction.

12. (Currently amended) An apparatus for treating water with a first and a second chemical, comprising:

a water pump for pumping the water from a water source into a first inlet port of an intake manifold;

a first chemical pump for pumping a first chemical into a second inlet port of said intake manifold;

a first static mixing device having an inlet ~~port connected~~ in fluid communication with an outlet port of said intake manifold for mixing the first chemical with the water;

an outlet ~~port~~ of said first static mixing device being connected to a first inlet port of an interconnecting manifold;

said first static mixing device comprising a first tube having a generally square cross section ~~defining four generally acute corners~~;

said first tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a first plurality of helices for ~~imparting a helical flow to the liquid between said inlet port and said outlet port of said first static mixing device for~~

~~mixing the first chemical with the liquid causing the first chemical flowing through said first tube to rotate and to mix with the liquid;~~

a second chemical pump for pumping a second chemical into a second inlet port of said interconnecting manifold;

a second static mixing device having an inlet ~~port connected~~ in fluid communication with an outlet port of said interconnecting manifold for mixing the second chemical with the water and for eluting the treated water from an outlet port of said second static mixing device; ~~and~~

said second static mixing device comprising a second tube having a generally square cross section ~~defining four generally acute corners;~~

said second tube being spirally twisted with said plurality of corners forming a second plurality of helixes for causing the second chemical flowing through said second tube to rotate and to mix with the liquid; ~~and~~

said second tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a second plurality of helixes for ~~imparting a helical flow to the liquid between said inlet port and said outlet port of said second static mixing device for mixing the second chemical with the liquid causing the second chemical flowing through said second tube to rotate and to mix with the liquid;~~

13. (Canceled)

14. (Canceled)

15. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 12, wherein said second static mixing device has a cross-section greater than said first static mixing device for providing a high shear first static mixing device and to provide a low shear second static mixing device.
16. (Canceled)
17. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 12, wherein said one of said first and second static mixing device comprises a first and a second spirally twisted tube section;  
said first tube section being spirally twisted in a first direction for causing the liquid flowing through said first tube section to flow in a first helical direction; and  
said second tube section being spirally twisted in a second direction for causing the liquid flowing through said second tube section to flow in a second helical direction.
18. (Currently amended) An apparatus for treating waste water for removing dissolved and suspended material contained within the waste water, comprising:  
a water pump for pumping the waste water from a waste water source into a first inlet port of an intake manifold;  
a first chemical pump for pumping a first chemical into a second inlet port of said intake manifold;  
a first static mixing device having an inlet port connected in fluid communication with an outlet port of said intake manifold;



said first static mixing device comprising a first tube having a generally square cross section ~~defining four generally acute corners;~~

said first tube being spirally twisted with said ~~plurality of corners generally square cross section~~ forming a first plurality of helixes for ~~imparting a helical flow to the liquid between said inlet port and said outlet port of said first static mixing device for mixing the first chemical with the liquid causing the first chemical flowing through said first tube to rotate and to mix with the liquid;~~

an outlet port of said first static mixing device being connected to a first inlet port of an interconnecting manifold;

a second chemical pump for pumping a second chemical into a second inlet port of said interconnecting manifold; ~~and~~

a second static mixing device having an inlet port connected in fluid communication with an outlet port of said interconnecting manifold; ~~and~~

said second static mixing device comprising a second tube having a generally square cross section ~~defining four generally acute corners;~~

said second tube being spirally twisted with said plurality of corners forming a second plurality of helixes for causing the second chemical flowing through said second tube to rotate and to mix with the liquid; ~~and~~

said second tube being spirally twisted with said ~~plurality of corners generally square cross section~~ forming a second plurality of helixes for ~~imparting a helical flow to the liquid between said inlet port and said outlet port of said second static mixing device for mixing the second chemical with the liquid causing the second chemical flowing through said second tube to rotate and to mix with the liquid.~~

19. (Canceled)
20. (Canceled)
21. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 18, wherein said second static mixing device has a cross-section greater than said first static mixing device for providing a high shear first static mixing device and to provide a low shear second static mixing device.
22. (Original) An apparatus for treating a liquid with a first and a second chemical as set forth in claim 18, wherein said one of said first and second static mixing device comprises a first and a second spirally twisted tube section;
- said first tube section being spirally twisted in a first direction for causing the liquid flowing through said first tube section to flow in a first helical direction; and
- said second tube section being spirally twisted in a second direction for causing the liquid flowing through said second tube section to flow in a second helical direction.
23. (Currently amended) An apparatus for mixing a liquid with a first chemical, comprising:
- a liquid pump for pumping the liquid from a liquid source into a first inlet port of an intake manifold;
- a second inlet port of said intake manifold introducing a first chemical into the liquid;
- a static mixing device having an inlet port connected in fluid communication with an outlet port of said intake manifold for mixing the first chemical with the liquid;
- said first static mixing device comprising a first tube having a generally square cross section

~~defining four generally acute corners;~~

said first tube being spirally twisted with said plurality of corners forming a first plurality of helixes for causing the first chemical flowing through said first tube to rotate and to mix with the liquid;

said first tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a first plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said first static mixing device for mixing the first chemical with the liquid ~~causing the first chemical flowing through said first tube to rotate and to mix with the liquid;~~

said outlet port of said static mixing device being connected to a first inlet port of an interconnecting manifold;

a second static mixing device having an inlet port ~~connected~~ in fluid communication with an outlet port of said interconnecting manifold for mixing the first chemical with the liquid and for eluting the treated liquid from an outlet port of said second static mixing device; ~~and~~

said second static mixing device comprising a second tube having a generally square cross section ~~defining four generally acute corners;~~ and

said second tube being spirally twisted with said ~~plurality of corners~~ generally square cross section forming a second plurality of helixes for imparting a helical flow to the liquid between said inlet port and said outlet port of said second static mixing device for mixing the second chemical with the liquid ~~causing the second chemical flowing through said second tube to rotate and to mix with the liquid.~~

24. (Original) An apparatus for mixing a liquid with a first chemical as set forth in claim 23, wherein said first inlet port of said intake manifold being normal to said second inlet port of said intake manifold for providing high shear mixing of the first chemical in the liquid.
25. (Canceled)
26. (Canceled)
27. (Canceled)
28. (Original) An apparatus for treating a liquid with a first chemical as set forth in claim 23, wherein said one of said first and second static mixing device comprises a first and a second spirally twisted tube section;  
said first tube section being spirally twisted in a first direction for causing the liquid flowing through said first tube section to flow in a first helical direction; and  
said second tube section being spirally twisted in a second direction for causing the liquid flowing through said second tube section to flow in a second helical direction.
29. (Canceled)
30. (Canceled)